# 2010 ASME International Design Engineering Technical Conferences & Computers and Information In Engineering Conference

- 36th Design Automation Conference (DAC)

- 34th Annual Mechanisms and Robotics Conference (MR)

- 30th Computers and Information in Engineering Conference (CIE)

- 22nd International Conference on Design Theory and Methodology (DTM)

- 15th Design for Manufacturing and the Lifecycle Conference (DFMLC)

- 12th International Conference on Advanced Vehicle and Tire Technologies (AVTT)

- 7th Symposium on International Design and Design Education (DEC)

- 4th International Conference on Micro- and Nanosystems (MNS)

- Special Conference on Mechanical Vibration and Noise (VIB)

The Fairmont Queen Elizabeth
Montréal, Quebec, Canada
August 15–18, 2010
http://www.asmeconferences.org/IDETC2010/

**Final Program**

## IDETC/CIE 2010 CHAIRS' WELCOME



**Pierre Larochelle**
General Conference Chair
Florida Institute of Technology

**Andrew Murray**
Technical Program Chair
University of Dayton

On behalf of the ASME Design Engineering Division and the Computers in Engineering Division, it is our pleasure to welcome you to the 2010 ASME International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE) in Montréal, Québec, Canada. This meeting is the flagship international conference for Design Engineering and Computers and Information in Engineering. The Conference includes more than 730 scheduled technical presentations of high-quality peer-reviewed articles in the following technical conferences:

- 36th Design Automation Conference

- 34th Annual Mechanisms and Robotics Conference

- 30th Computers and Information in Engineering Conference

- 22nd International Conference on Design Theory and Methodology

- 15th Design for Manufacturing and the Lifecycle Conference

- 12th International Conference on Advanced Vehicle and Tire Technologies

- 7th Symposium on International Design and Design Education

- 4th International Conference on Micro- and Nano systems

- Special Conference on Mechanical Vibration and Noise

Montréal is a beautiful city with a rich history and culture that we hope you will take the time to experience. The main reception Monday evening takes place at the Marche Bonsecours- a historic building that opened in 1847, served as Montréal's City Hall for 26 years, and for a brief period housed the Parliament of United Canada. At the reception you will have the opportunity to enjoy traditional Québec foods and music as well as to stroll along the St. Lawrence River or walk around Old Town's cobblestone streets. Moreover, we have arranged for an opening reception at McGill University as well as tours of the Canadian Space Agency, McGill University, and École de Technologie Supérieure.

Finally, we wish to express our sincere thanks and appreciation to all of the many volunteers and staff that helped to organize this meeting; the organizing committee, conference chairs, program chairs, and of course the ASME staff.

Best wishes for an enjoyable and productive conference!

## CIE-13 Computational Multiphysics Applications (AMS)

### CIE-13-1 Computational Multiphysics Applications

**Hochelaga 3**        **9:00am – 10:30am**

Session Chair: **Valeria Krzhizhanovskaya,** *University of Amsterdam, Amsterdam, Netherlands*
Session Co-Chair: **Ashok Kumar,** *University of Florida, Gainesville, FL, United States,* **John G. Michopoulos,** *Naval Research Laboratory, Washington, DC, United States*

**Reverse Engineering of Experimental Tests Results of Ballistic Impact for the Validation of Finite Element Simulations**
**Technical Publication.** DETC2010-28163
   **Grazia Magrassi, Andrea Manes, Marco Giglio, Monica Bordegoni,** *Politecnico di Milano, Milano, Italy*

**On a Data and Requirements Driven Multi-Scale Framework Linking Performance to Materials**
**Technical Publication.** DETC2010-28335
   **John G. Michopoulos, Samuel G. Lambrakos,** *U.S. Naval Research Laboratory, Washington, DC, United States,* **Athanasios Iliopoulos,** *Science Applications Inter. Corp. /co. U.S. Naval Resarch Laboratory, Washington, DC, United States*

**Multiscale Modeling of Ductile Iron Solidification with Continuous Nucleation by Cellular Automaton**
**Technical Publication.** DETC2010-28764
   **Andriy Burbelko, Daniel Gurgul, Edward Fras, Edward Guzik,** *AGH University of Science and Technology, Krakow, Poland*

**Multiphysics Simulation of Honeycomb Solar Cell Photoabsorption Efficiency**
**Technical Presentation Only.** DETC2010-28984
   **Alexander Fedoseyev, Frantisek Cajko,** *CFD Research Corporation, Huntsville, AL, United States*

**A Roadmap to Multiscale Modeling of Flood Defense Systems: From Sand Grain to Dike Failure and Inundation**
**Technical Presentation Only.** DETC2010-28967
   **Valeria Krzhizhanovskaya,** *University of Amsterdam, Amsterdam, Netherlands*

## DTM-8 Design Behavior Study

### DTM-8-1 Design Behavior Study

**Chaudiere**        **9:00am – 10:30am**

Session Chair: **Andy Dong,** *University of Sydney, Sydney, Australia*
Session Co-Chair: **Claudia Eckert,** *The Open University, Milton Keynes, United Kingdom*

**A Comparison of Formal Methods for Evaluating the Language of Preference in Engineering Design**
**Technical Publication.** DETC2010-29045
   **Tomonori Honda, Maria Yang,** *MIT, Cambridge, MA, United States,* **Andy Dong,** *University of Sydney, Sydney, Australia,* **Haifeng Ji,** *Yahoo, Inc., Sunnyvale, CA, United States*

**Using Emergent Symbols to Discover Multi-Lingual Translations in Design**
**Technical Publication.** DETC2010-29216
   **Amitabha Mukerjee, Madan Dabbeeru,** *Indian Institute of Technology Kanpur, Kanpur, India*

**Potential Limitations of Verbal Protocols In Design Experiments**
**Technical Publication.** DETC2010-28675
   **Ivey Chiu, L.H. Shu,** *University of Toronto, Toronto, ON, Canada*

**Analysis of Design Activities Using EEG Signals**
**Technical Publication.** DETC2010-28477
   **Thanh An Nguyen, Yong Zeng,** *Concordia University, Montreal, QC, Canada*

**Exploring the Meaning of Success in Outsourced Product Development**
**Technical Publication.** DETC2010-29147
   **William J. Palm IV, Daniel Whitney,** *Massachusetts Institute of Technology, Cambridge, MA, United States*

## DFMLC-7 Design for Service, Design for Quality

### DFMLC-7-1 Design for Service, Design for Quality, Integrated Assembly Design and Planning

**Matapedia**        **9:00am – 10:30am**

Session Chair: **Marcos Esterman,** *Rochester Institute of Technology, Rochester, NY, United States*

**Service Information for Product Quality**
**Technical Publication.** DETC2010-28085
   **Kenji Iino,** *SYDROSE LP, San Jose, CA, United States,* **Masayuki Nakao,** *The University of Tokyo, Tokyo, Japan*

**Weibull Distributed Stress-Dependent Strength Analysis of Aeroengine Alloy using Lagrange Factor Polynomial**
**Technical Publication.** DETC2010-28090
   **Chun Nam Wong, Jingqi Xiong, Tianyou Hu,** *University of Electronic Science and Technology of China, Chengdu, Sichuan, China,* **Hong-Zhong Huang,** *School of Mechatronics Engineering, University of Electronic Science & Technology of China, Chengdu, China*

**Investigation into the Flexural Strength of a Material for Resin-reinforced Rapid Prototyping Transtibial Sockets**
**Technical Publication.** DETC2010-28176
   **L. H. Hsu, C.T. Lu,** *National Cheng Kung University, Tainan, Taiwan,* **G.F. Huang, J.T. Chen, H.S. Yang, H.S. Shih,** *Fooyin University, Kaohsiung, Taiwan*

**Design Requirements for a Tendon Rehabilitation Robot: Results from a Survey of Engineers and Health Professionals**
**Technical Publication.** DETC2010-28529
   **Volkan Patoglu, Gurdal Ertek, Ozgur Oz,** *Sabanci University, Istanbul, Turkey,* **Deniz Zoroglu,** *Sabanci University, 34956, Turkey,* **Gul Okudan,** *Penn State, University Park, PA, United States*

**WEDNESDAY AM**